

BIOTOXIN QUARTERLY REPORT

October - December 2002



BIOTOXIN SUMMARY

The enclosed reports (No. 02-30 through 02-35) provide a summary of biotoxin activity and toxigenic phytoplankton distribution for the months of October through December 2002.

PSP Toxicity Increases

September – By October *Alexandrium* had begun decreasing along the northern California coast, although it was still present at sites in Marin and Monterey counties. Similarly, PSP toxin levels declined but were still detectable from Marin through Mendocino counties. Although low numbers of *Alexandrium* were observed at numerous locations between San Luis Obispo and Santa Barbara counties, PSP toxicity was not detected in shellfish from this region.

In contrast, the relative abundance of *Pseudo-nitzschia* increased in relative abundance from the previous month. Volunteer phytoplankton samplers allowed us to catch a bloom of this diatom in the northern California region between Crescent City and

Humboldt Bay, as well as farther south along the San Luis Obispo coast. Thanks to their efforts a number of shellfish samples were collected and delivered to the Department of Health Services' Food and Drug Laboratory for domoic acid analysis at the beginning of November.

November – By the first week of November we detected domoic acid in shellfish from the northern California sites where *Pseudo-nitzschia* was previously observed in high numbers. The concentration of this toxin exceeded the alert level (20 ppm) in mussels from the U.S. Coast Guard dock just inside Humboldt Bay (27 ppm). The concentration of this toxin was lower in mussels farther inside the bay (13 ppm) and farther north in Del Norte County (9.8 ppm). Domoic acid was not detected at these sites throughout the remainder of November. Despite the high relative abundance of *Pseudo-nitzschia* along the San Luis Obispo coast in October,

we did not detect domoic acid in any shellfish samples from this area.

December – PSP and domoic acid toxin levels were nondetectable in December. Nonetheless it was of interest that low numbers of *Alexandrium* continued to be present at several locations along the California coastline. Also of interest was the significant increase in *Pseudo-nitzschia* relative abundance at Goleta Pier (Santa Barbara County).

QUARANTINES

The annual mussel quarantine was rescinded on schedule at midnight, October 31. This annual quarantine went into effect early in 2002, beginning on April 19 rather than the normal starting time of May 1.

SPECIAL THANKS!

We continue to be indebted to all of our program participants, and none more so than Whit and Judy Whitmire. Judy and Whit have tirelessly collected and observed phytoplankton samples at several sites along the San Luis Obispo and Monterey coastline, also taking to time to grab mussel samples when the tide allowed. In little more than a year they had collected over 100 samples from a total of eight different stations. With Judy's retirement they have traded in their plankton net for a snow shovel and headed for the mountains. A special thanks to good friends for all their help!



How to Contact Us:

The Biotoxin Quarterly Report is prepared and distributed by the California Department of Health Services' Marine Biotoxin Monitoring and Control Program.

For information on our program please call (510) 540-3423, fax us at (510) 540-2716, or send an email to glangloi@dhs.ca.gov.

Call our toll-free number for recorded information on shellfish quarantines related to marine biotoxins: (800) 553-4133.

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Table 1. California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during October 2002.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	10
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	Sonoma County Public Health Department	1
Marin	Cove Mussel Company	3
	CDHS Marine Biotoxin Program	1
	Hog Island Oyster Company	5
	Johnson Oyster Company	25
	Marin Oyster Company	5
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	2
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	8
Santa Barbara	U.C. Santa Barbara Marine Science Institute	5
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	3
Orange	Ecomar, Inc.	4
	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4
	CDHS Volunteer (Paul Sims)	1

Table 2. Agencies and organizations participating in marine phytoplankton sample collection in California during October 2002.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	3
Mendocino	CDHS Volunteers (Amy Johnson, Jim Wesley)	2
Sonoma	Bodega Marine Lab	2
Marin	CDHS Volunteers (Brent Anderson, Cal Strobel, Richard Plant)	7
	Johnson Oyster Company	4
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	2
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	San Lorenzo Valley High School	1
	CDHS Marine Biotxin Program	1
Monterey	CDHS Volunteer (Whit and Judy Whitmire)	1
	U.C. Reserve System	1
San Luis Obispo	CDHS Volunteers (Whit and Judy Whitmire, Renee and Auburn Atkins)	7
	Morro Bay National Estuary Program	2
	Tenera Environmental	3
Santa Barbara	U.C. Santa Barbara Marine Sciences	4
	Santa Barbara City College	1
Ventura	None Submitted	
Los Angeles	Los Angeles County Sanitation District	1
	Los Angeles County Health Department	3
	City of Los Angeles Environmental Monitoring Division	1
	Los Angeles Regional Water Quality Control Board	1
	Catalina Island Marine Institute	2
	Catalina Tall Ships Expeditions	2
Orange	None Submitted	
San Diego	San Diego County Environmental Health Department	2
	CDHS Volunteer (Paul Sims)	1

Table 3. California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during November 2002.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	12
Mendocino	None Submitted	
Sonoma	CDHS Marine Biotoxin Program	1
Marin	Cove Mussel Company	2
	Hog Island Oyster Company	2
	Johnson Oyster Company	16
	Marin Oyster Company	4
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	3
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	8
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	3
Orange	Ecomar, Inc.	2
	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4
	CDHS Volunteer (Paul Sims)	2

Table 4. Agencies and organizations participating in marine phytoplankton sample collection in California during November 2002.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
Mendocino	CDHS Volunteers (Amy Johnson, Jim Wesley)	2
Sonoma	None Submitted	3
Marin	CDHS Volunteers (Brent Anderson, Richard Plant)	7
	Johnson Oyster Company	16
	California Department of Fish and Game	2
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	1
	Gulf of the Farallones National Marine Sanctuary	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	San Lorenzo Valley High School	1
	Santa Cruz County Environmental Health Department	5
Monterey	None Submitted	
San Luis Obispo	CDHS Volunteers (Renee and Auburn Atkins)	3
	Tenera Environmental	1
	Morro Bay National Estuary Program	4
	CDHS Marine Biotoxin Program	1
Santa Barbara	U.C. Santa Barbara Marine Sciences	3
	Santa Barbara City College	1
	CDHS Marine Biotoxin Program	2
Ventura	CDHS Marine Biotoxin Program	1
Los Angeles	Los Angeles County Sanitation District	2
	Los Angeles County Health Department	2
	City of Los Angeles Environmental Monitoring Division	2
	Catalina Tall Ships Expeditions	1
	Los Angeles Regional Water Quality Control Board	1
Orange	Orange County Sanitation District	5
San Diego	San Diego County Environmental Health Department	2

Table 5. California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during December 2002.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	9
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	1
	Hog Island Oyster Company	2
	Johnson Oyster Company	20
	Marin Oyster Company	3
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	2
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	10
Santa Barbara	U.C. Santa Barbara Marine Science Institute	5
Ventura	None Submitted	
Los Angeles	None Submitted	
Orange	Ecomar, Inc.	2
	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	3
	CDHS Volunteer (Paul Sims)	1

Table 6. Agencies and organizations participating in marine phytoplankton sample collection in California during December 2002.

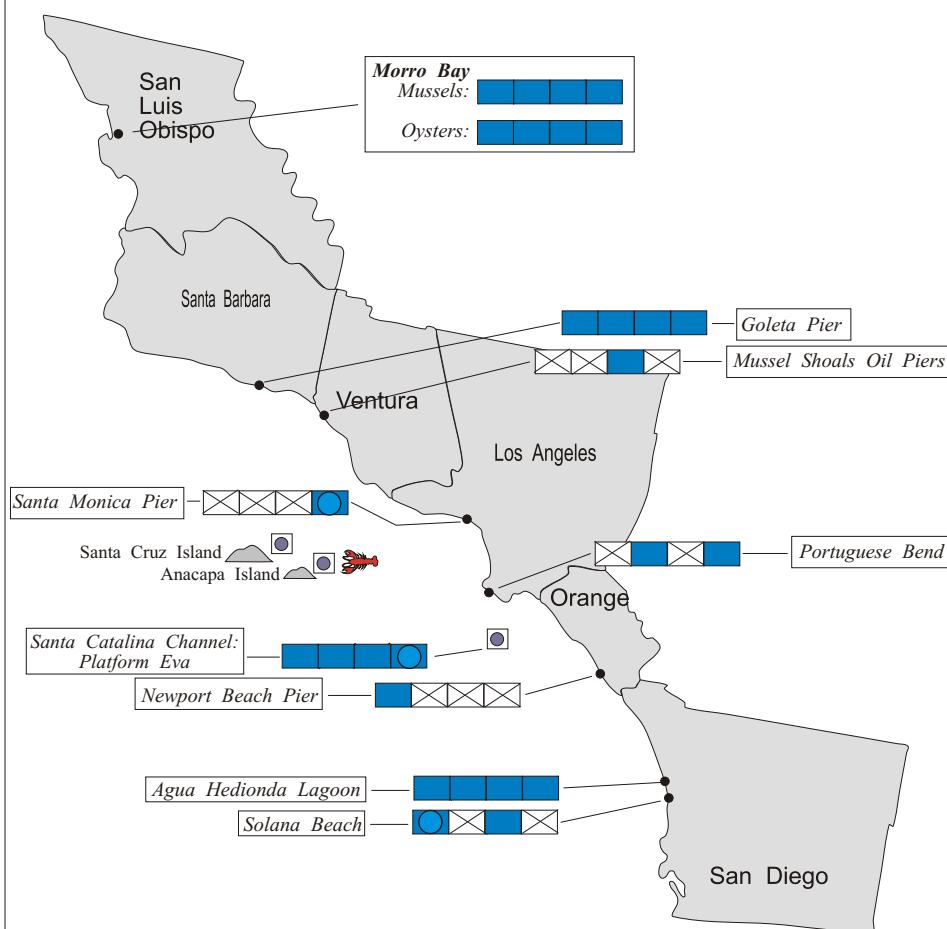
COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Environmental Health Department	2
Humboldt	Coast Seafood Company	5
Mendocino	None Submitted	
Sonoma	CDHS Volunteer (Cathleen Cannon)	1
Marin	CDHS Volunteers (Brent Anderson, Richard Plant, Cal Strobel)	7
	Johnson Oyster Company	20
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	3
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	San Lorenzo Valley High School	1
Monterey	None Submitted	
San Luis Obispo	CDHS Volunteers (Renee and Auburn Atkins, Bill Schwebel)	3
	Tenera Environmental	2
	Morro Bay National Estuary Program	3
Santa Barbara	U.C. Santa Barbara Marine Sciences	5
	Santa Barbara City College	1
Ventura	None Submitted	
Los Angeles	Los Angeles County Sanitation District	3
	Los Angeles County Health Department	2
	Los Angeles Regional Water Quality Control Board	1
Orange	Orange County Sanitation District	2
	Ocean Institute	1
San Diego	San Diego County Environmental Health Department	1

SHELLFISH BIOTOXIN MONTHLY REPORT

October 2002

Technical Report No. 02-30

Distribution of Shellfish Biotoxins Southern California



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: (ppm) no sample not detected < 20² ≥ 20

¹PSP Alert Level ²DA Alert Level
● = Single Site ● = Multiple Sites ● = Offshore Site

Source: DHSMarine Biotoxin Monitoring and Control Program, October 2002.

INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

Southern California Summary:

Paralytic Shellfish Poisoning (PSP): PSP toxins were not detected in shellfish samples from southern California locations during October.

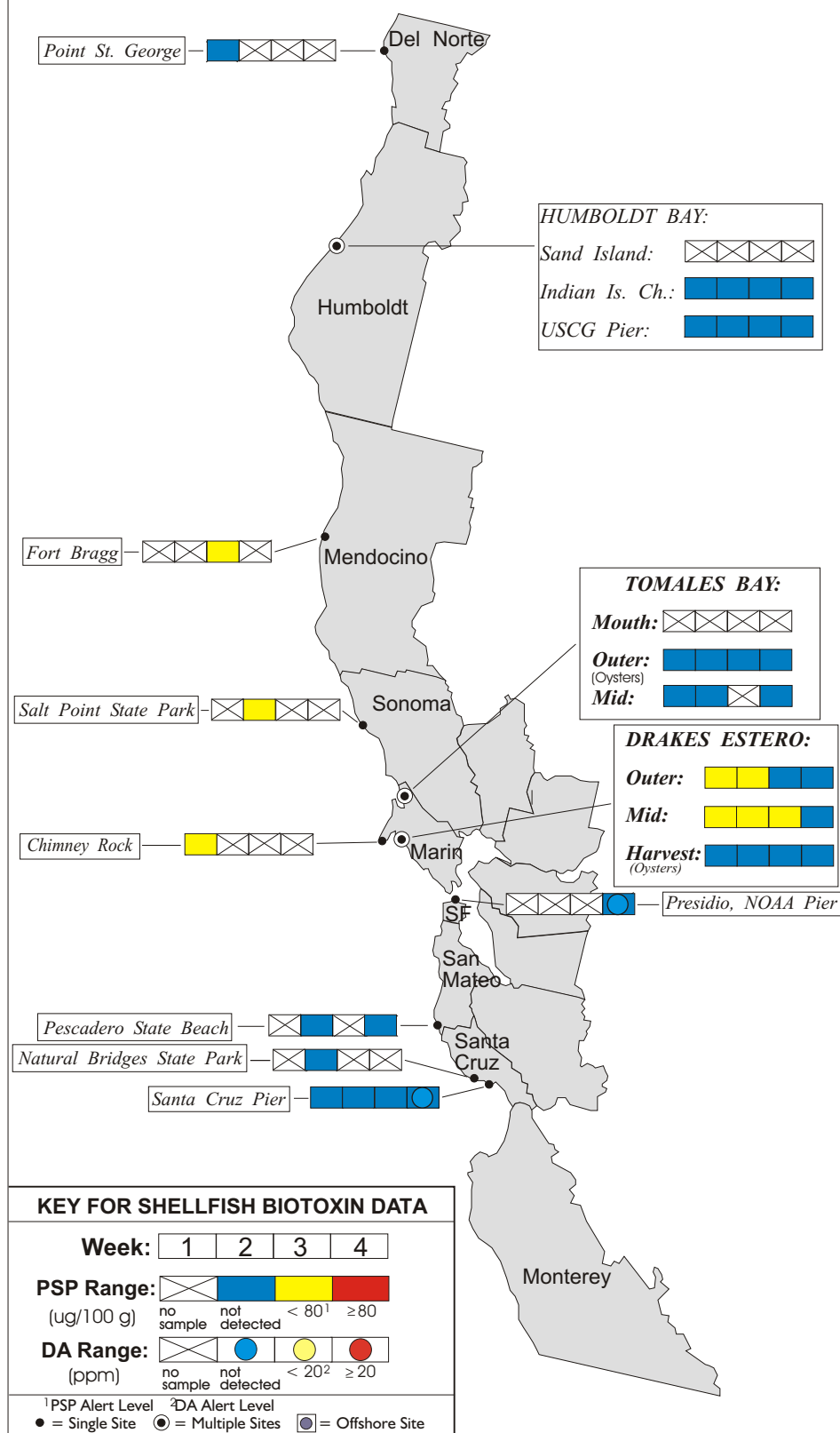
Domoic Acid (DA):

DA was not detected in shellfish samples from southern California locations during October. High levels of domoic acid continued to be detected in lobster viscera, however. A sample from Anacapa Island, collected on October 8, contained 150 ppm of domoic acid.

*For Information on our Volunteer
Field Sampling Program Please Call:*

(510) 540-3423

Distribution of Shellfish Biotoxins Northern California



Northern California Summary:

Paralytic Shellfish Poisoning (PSP):

Levels of PSP toxins continued to decline through October but persisted at several locations. Low levels of these toxins were detected in mussels from Fort Bragg (Mendocino County) and Salt Point State Park (Sonoma County). Low levels of PSP toxins were also detected in mussels from our Drakes Bay sentinel station and from Drakes Estero.

Domoic Acid (DA):

DA was not detected in shellfish samples from northern California locations during October.

The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.

*For More Information Please Call:
(510) 540 - 3423*

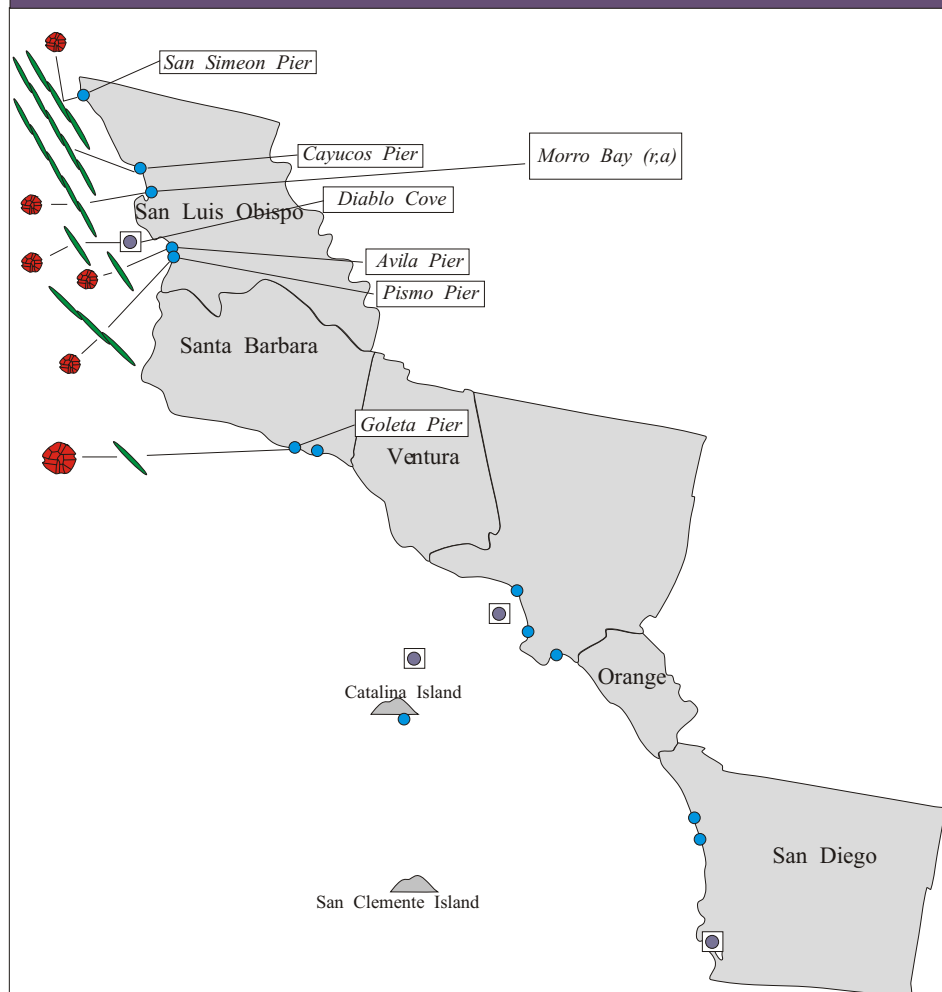
*For Recorded Biotoxin Information Call:
(800) 553 - 4133*

Phytoplankton Monthly Report

October 2002

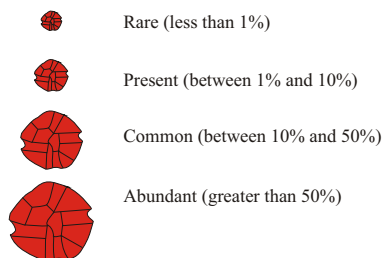
Technical Report No. 02-31

Distribution of Toxin-Producing Phytoplankton Southern California



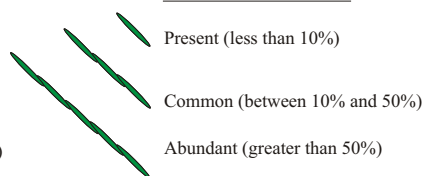
Relative Abundance of Known Toxin Producers

Alexandrium Species



For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Pseudo-nitzschia Species



MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Southern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). The distribution and relative abundance of *Alexandrium* along the southern California coast in October declined from observations in September. Low numbers of this dinoflagellate were observed at sites between Santa Barbara and San Luis Obispo counties.

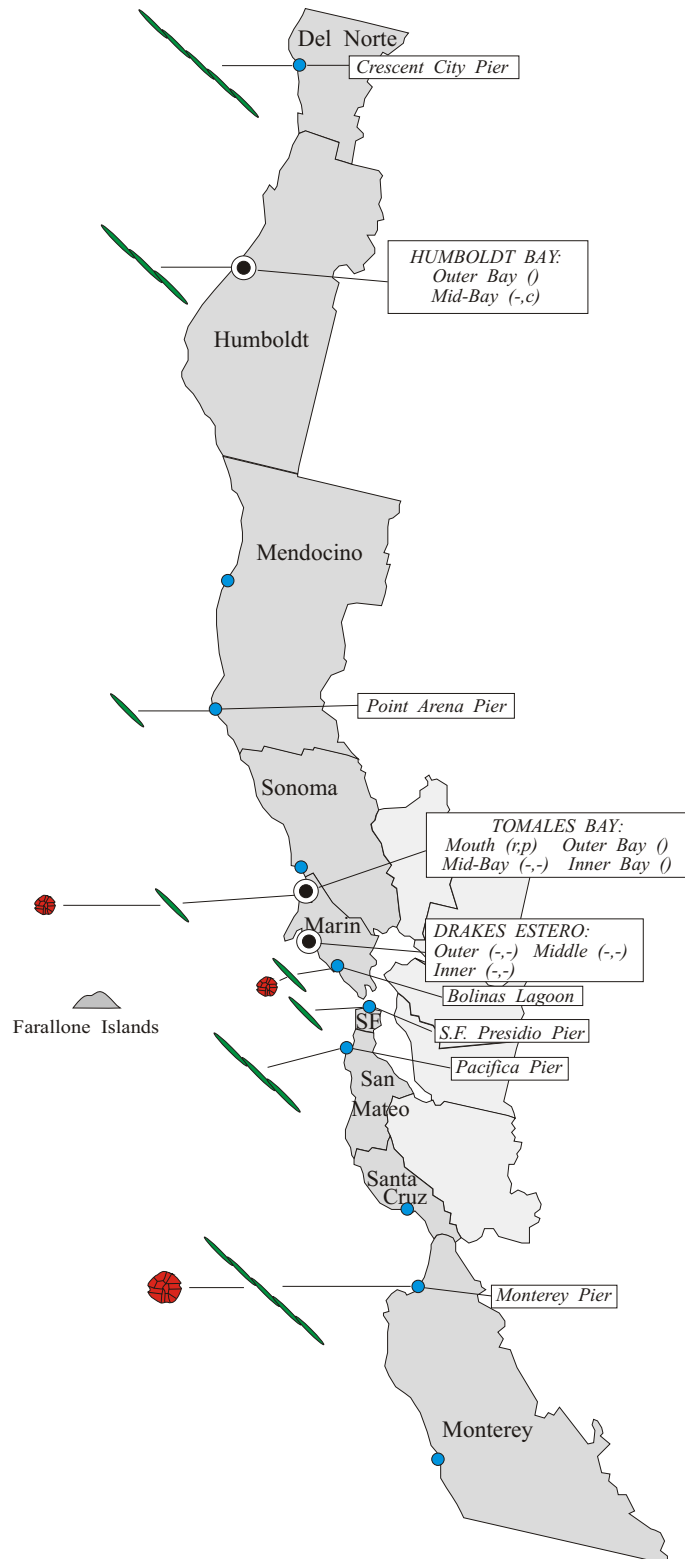
Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). The distribution of *Pseudo-nitzschia* along the southern California coast declined in October compared to observations in September. However the relative abundance of this diatom increased along the San Luis Obispo coast, particularly towards the end of the month.

The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.

For More Information Please Call:
(510) 540 - 3423

For Recorded Biotxin Information Call:
(800) 553 - 4133

Distribution of Toxin-Producing Phytoplankton Northern California



Northern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). The distribution and abundance of *Alexandrium* in October was reduced from observations in September. Low numbers of this dinoflagellate were observed at sites in Marin and Monterey counties. Cell densities were low in all cases.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). In general the distribution and abundance of *Pseudo-nitzschia* along the northern California coast in October increased somewhat from September's observations. This diatom was abundant in Crescent City (Del Norte County) and at the commercial pier in Monterey. Elevated numbers were also observed inside Humboldt Bay and along the San Mateo coast at Pacifica.

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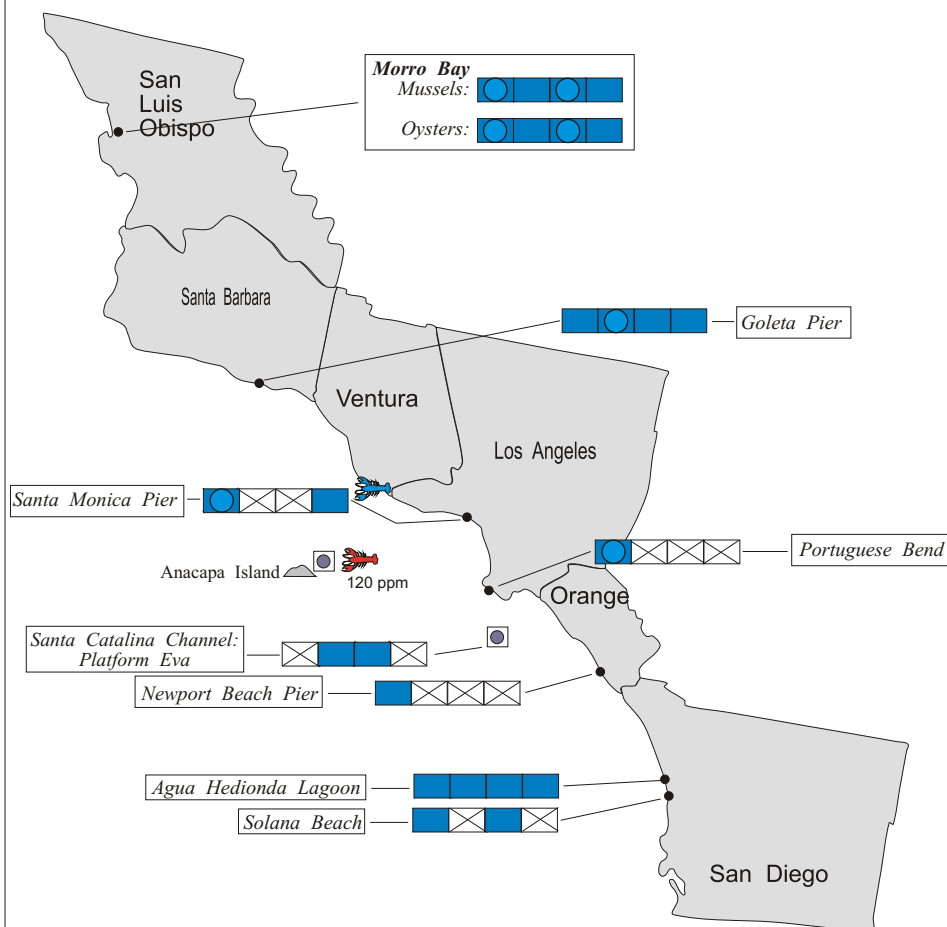
For Recorded Biotxin Information Call:
(800) 553 - 4133

SHELLFISH BIOTOXIN MONTHLY REPORT

November 2002

Technical Report No. 02-32

Distribution of Shellfish Biotoxins Southern California



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: [Blue bar with 4 segments] [Yellow bar with 4 segments] [Red bar with 4 segments]
(ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: [Blue bar with 4 segments] [Yellow bar with 4 segments] [Red bar with 4 segments]
(ppm) no sample not detected < 20² ≥ 20

¹PSP Alert Level ²DA Alert Level
● = Single Site ● = Multiple Sites ● = Offshore Site

Source: DHSMarine Biotoxin Monitoring and Control Program, November 2002.

INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

Southern California Summary:

Paralytic Shellfish Poisoning (PSP): PSP toxins were not detected in shellfish samples from southern California locations during November.

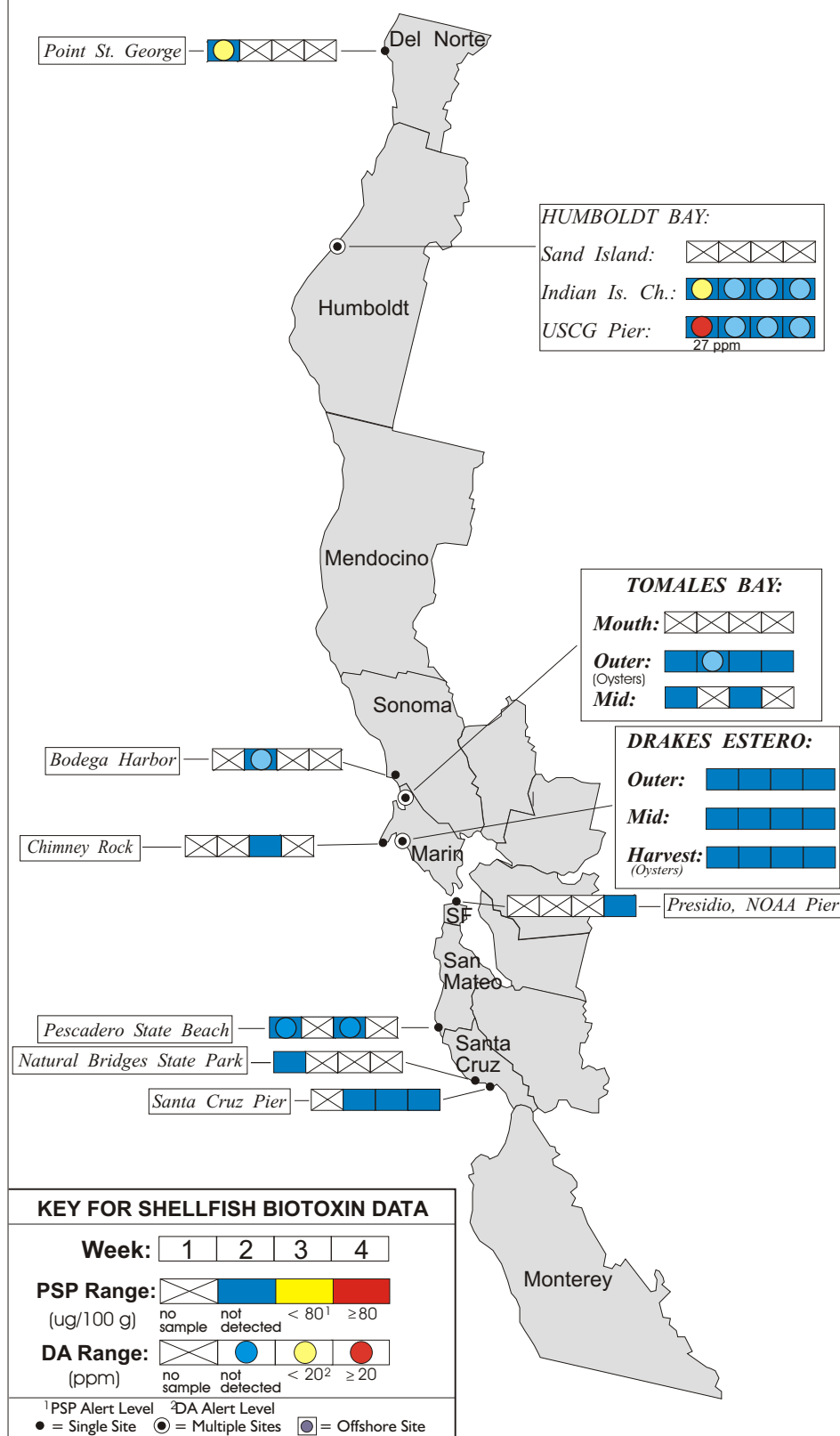
Domoic Acid (DA):

DA was not detected in shellfish samples from southern California locations during November. High levels of domoic acid continued to be detected in lobster viscera, however. A sample from Anacapa Island, collected on November 14, contained 120 ppm of domoic acid.

*For Information on our Volunteer
Field Sampling Program Please Call:*

(510) 540-3423

Distribution of Shellfish Biotoxins Northern California



Northern California Summary:

Paralytic Shellfish Poisoning (PSP):

PSP toxins were not detected in shellfish samples from northern California locations during November.

Domoic Acid (DA):

DA was detected in shellfish samples from northern California locations in Del Norte and Humboldt counties during the first week of November. Elevated levels of this toxin (27 ppm) were detected in sentinel mussels from the U. S. Coast Guard pier in Humboldt Bay (November 5). Mussels collected on the same day from farther inside the bay at Indian Island contained 13 ppm. A lower concentration of domoic acid (9.8 ppm) was also detected in mussels collected farther north at Point Saint George (Del Norte County) on November 4 following the observation of a *Pseudo-nitzschia* bloom in this region in late October.

The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.

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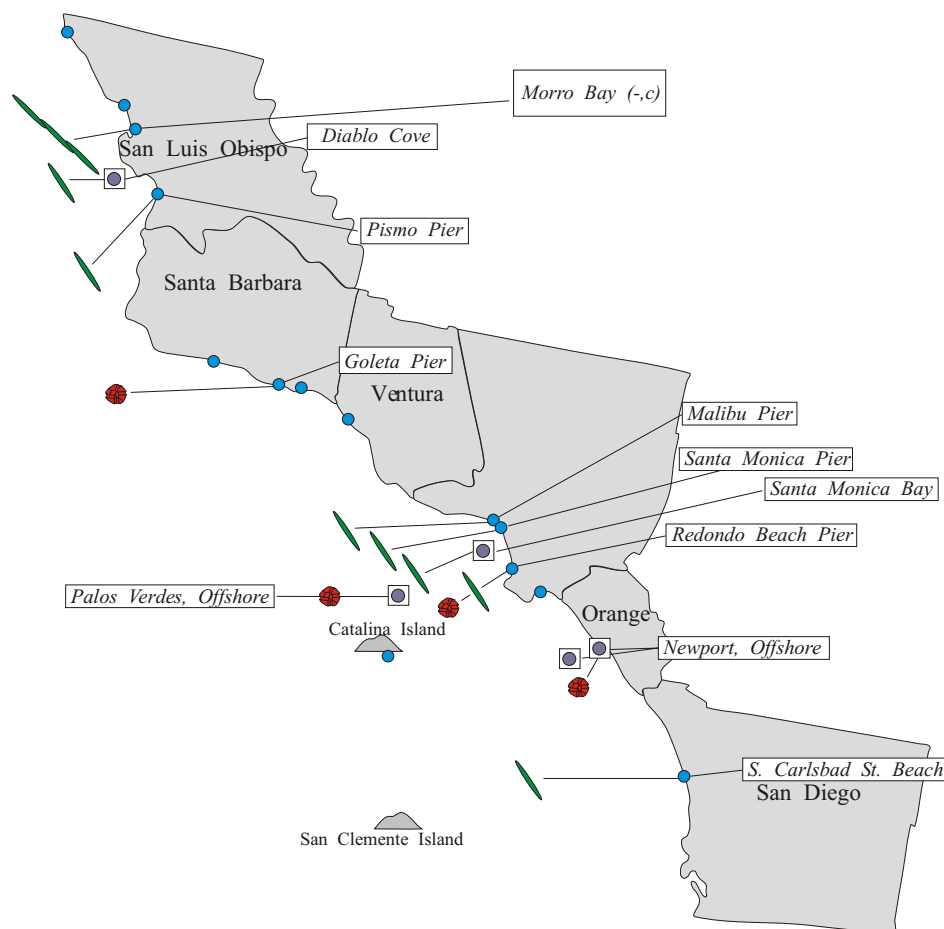
*For Recorded Biotoxin Information Call:
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Phytoplankton Monthly Report

November 2002

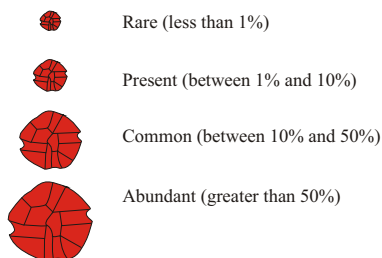
Technical Report No. 02-33

Distribution of Toxin-Producing Phytoplankton Southern California



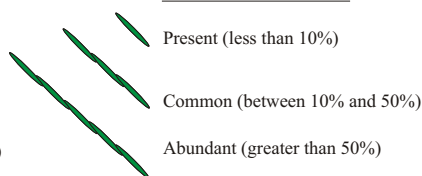
Relative Abundance of Known Toxin Producers

Alexandrium Species



For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Pseudo-nitzschia Species



MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Southern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was detected at several sites along the southern California coast in November. Low numbers of this dinoflagellate were observed at sites between Santa Barbara and Orange counties.

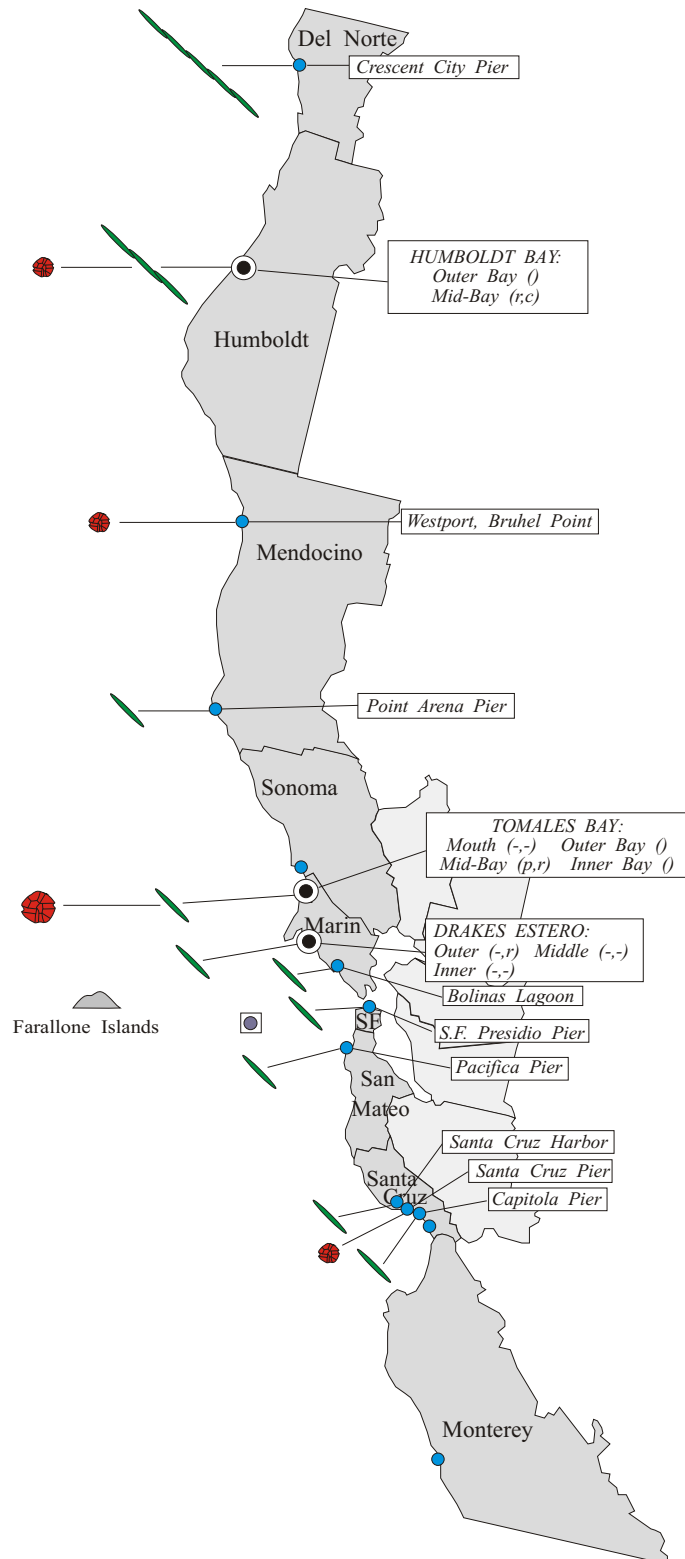
Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). The distribution of *Pseudo-nitzschia* along the southern California coast increased in November compared to observations in October, with the range extending from San Luis Obispo through San Diego. The relative abundance of this diatom was low at most sites.

The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.

For More Information Please Call:
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For Recorded Biotxin Information Call:
(800) 553 - 4133

Distribution of Toxin-Producing Phytoplankton Northern California



Northern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). The distribution and abundance of *Alexandrium* in November increased slightly from observations in October. Low numbers of this dinoflagellate were observed at sites in Santa Cruz, Marin, Mendocino and Humboldt counties. Cell densities were low in all cases.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). In general the distribution and abundance of *Pseudo-nitzschia* along the northern California coast in November was similar to October's observations. This diatom remained abundant in Crescent City (Del Norte County) and was also at elevated levels inside Humboldt Bay. Similar observations in October led to the analysis of shellfish for domoic acid, which revealed elevated levels of this toxin at both locations.

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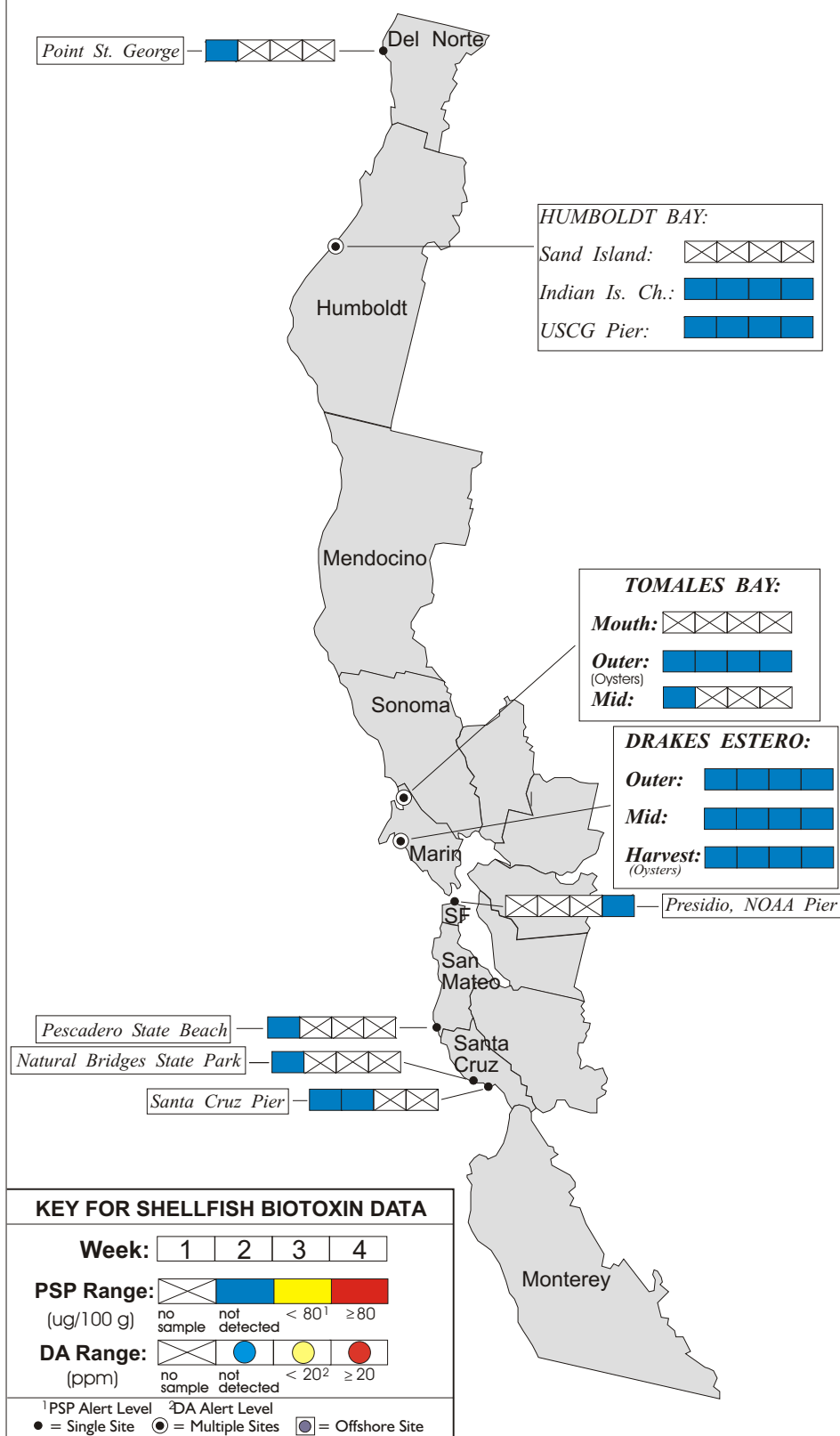
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(800) 553 - 4133*

Technical Report No. 02-34

(510) 540-3423

Distribution of Shellfish Biotoxins

Northern California



Northern California Summary:

Paralytic Shellfish Poisoning (PSP):

PSP toxins were not detected in shellfish samples from northern California locations during December.

The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.

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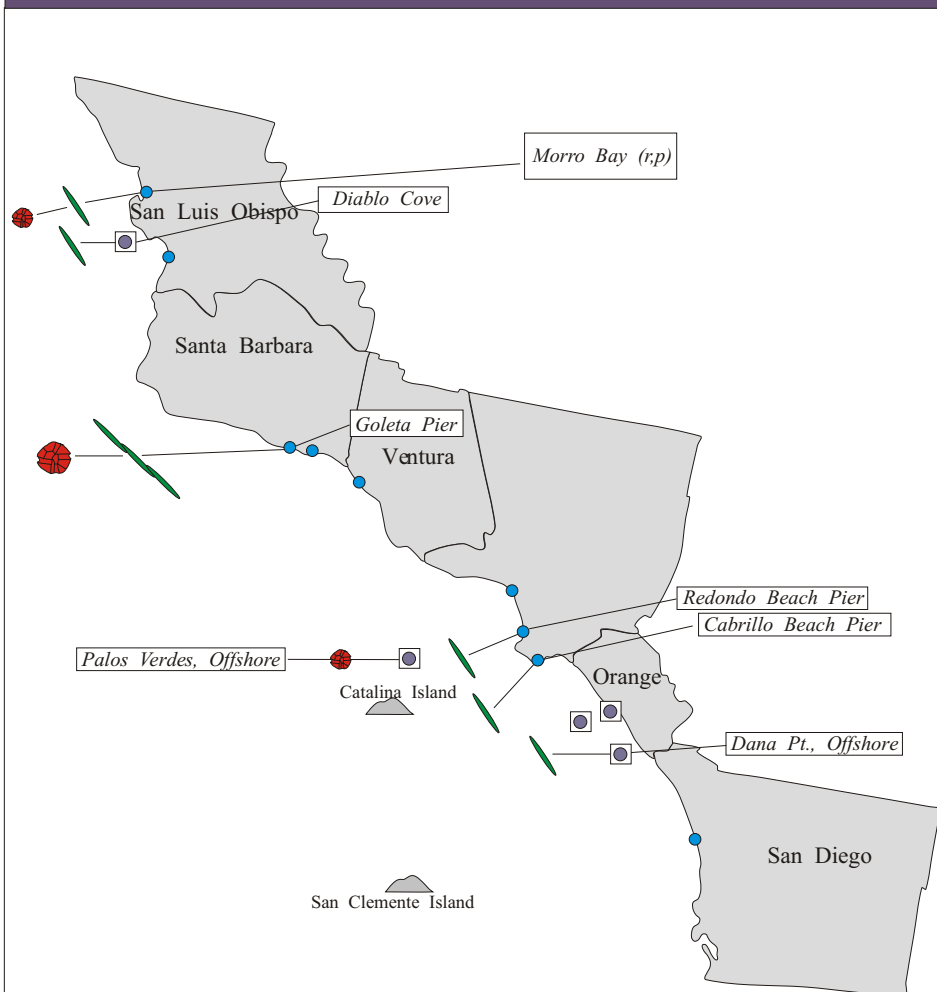
For Recorded Biotoxin Information Call:
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Phytoplankton Monthly Report

December 2002

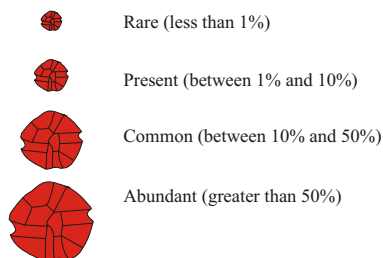
Technical Report No. 02-35

Distribution of Toxin-Producing Phytoplankton Southern California



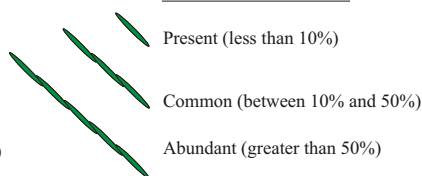
Relative Abundance of Known Toxin Producers

Alexandrium Species



For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Pseudo-nitzschia Species



MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- ⊙ Multiple Sampling Stations
- ◻ Offshore Sampling Station

Southern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was detected at several sites along the southern California coast in December. The greatest relative abundance was observed at Goleta Pier (Santa Barbara County), however cell numbers were low.

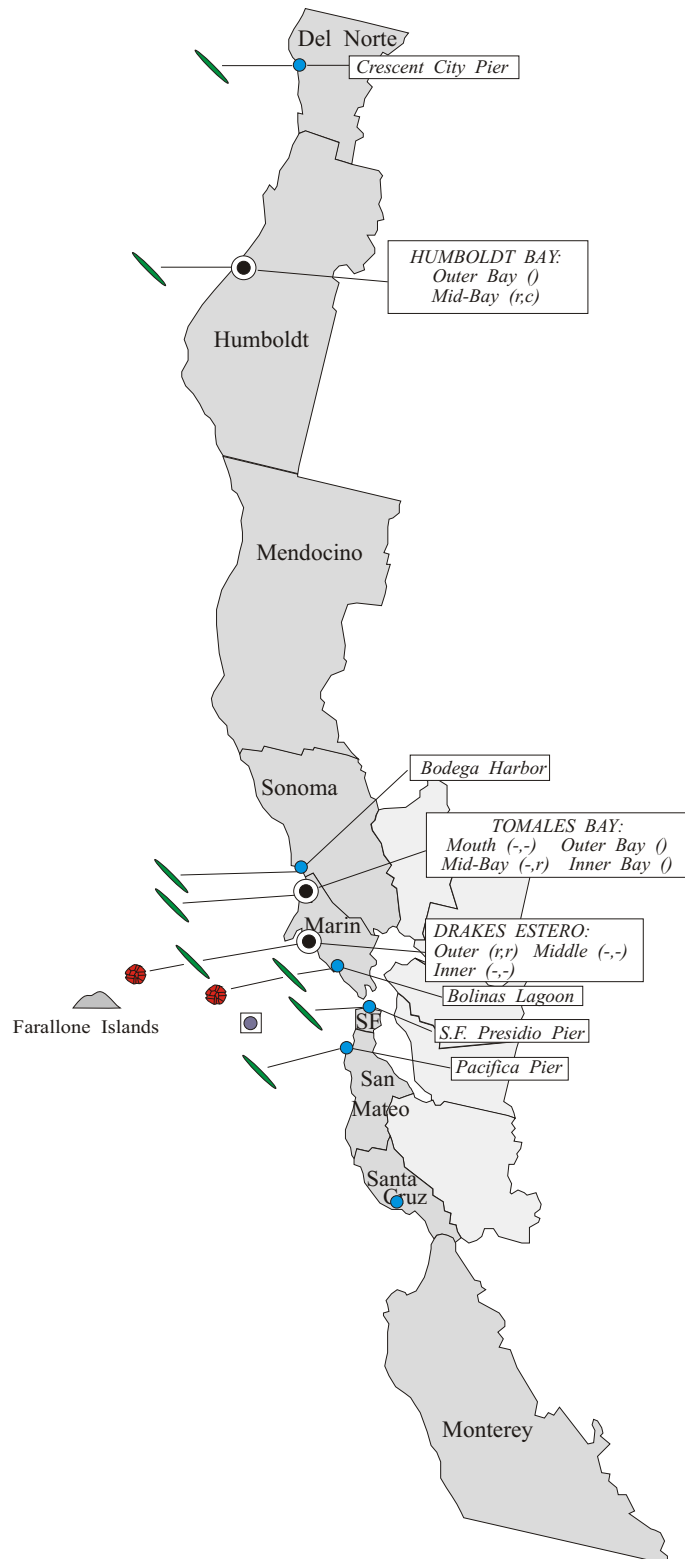
Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). The distribution of *Pseudo-nitzschia* along the southern California coast was similar to November's observations. The relative abundance of this diatom was low at most sites, although there was a noticeable increase at Goleta Pier (Santa Barbara County) at the beginning of December.

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For Recorded Biotxin Information Call:
(800) 553 - 4133

Distribution of Toxin-Producing Phytoplankton Northern California



Northern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). The distribution and abundance of *Alexandrium* in December decreased from observations in November. Low numbers of this dinoflagellate were observed at sites along the Marin coast.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). In general the distribution and abundance of *Pseudo-nitzschia* along the northern California coast in December decreased compared to November's observations. There was a dramatic decline in the numbers of this diatom along the Del Norte and Humboldt coast, which had experienced high cell densities and elevated levels of domoic acid in early November.

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